

THREE NEW SPECIES OF
STRENGERIANA FROM COLOMBIA
(CRUSTACEA: DECAPODA: PSEUDOTHELPHUSIDAE)

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Abstract.—Three new pseudothelphusid crabs, *Strengeriana cajaensis*, *S. maniformis*, and *S. flagellata*, are described from the Central Cordillera of Colombia. The last species displays a rudimentary flagellum on the exopod of the third maxilliped. This peculiar morphology reinforces the hypothesis that there exists a close phylogenetic relationship between the species of *Strengeriana* from northern South America and the species of *Epilobocera* from the West Indies.

The number of known species of *Strengeriana*, a group of small, primitive freshwater crabs from northern Colombia, has rapidly increased in recent years. The systematics and biogeography of the genus have been recently reviewed by Rodríguez & Campos (1989). Explorations in the Central Cordillera of Colombia have revealed the presence of three new species, which are described in the present contribution. One of these species possesses a rudimentary palp in the exopod of the third maxilliped.

The material is deposited at the Museo de Historia Natural, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá (ICN-MHN). Other abbreviations used are cb. for carapace breadth, and cl. for carapace length.

Tribe Strengerianini Rodríguez, 1982

Genus *Strengeriana* Pretzmann, 1971

Strengeriana cajaensis, new species

Fig. 1A–F

Material.—Municipio Cajamarca, creek by the side of the Central Highway, 1560 m above sea level, Tolima Department, Colombia; 3 Aug 1988; R. Sánchez; 1 male holotype, cb. 20.6 mm, cl. 13.2 mm (ICN-MHN No CR 0939).

Description.—The carapace is narrow (cb/cl = 1.57). The cervical grooves are straight

and deep, reaching the lateral margins. The antero-lateral margins have a depression behind the orbits followed by a few indistinct papillae and a second shallow depression at the level of the cervical groove; the rest of the margins have approximately 12 ill-defined papillae, which are regularly spaced. The postfrontal lobes are small, oval shaped and low. The median groove is absent. The surface of the carapace between the front and the postfrontal lobes is inclined anteriorly and towards the mid-line. The upper border of the front is rounded, without conspicuous tubercles, and slightly bilobed in dorsal view. The lower margin is thin, and slightly sinuous in frontal view. The surface of the front between the upper and lower borders is low. The surface of the carapace is smooth and polished; the limits between the regions of the carapace are indistinct.

The palm of the larger (right) chela is strongly inflated; the fingers gape moderately when closed. The walking legs are slender, but not unusually elongated, the largest being those of the second and third pair, which are also of the same length (total length approximately 1.28 the breadth of carapace); the merus in the third pair is 3.5 times longer than wide. The exopod of the third maxilliped is 0.97 times the length of the

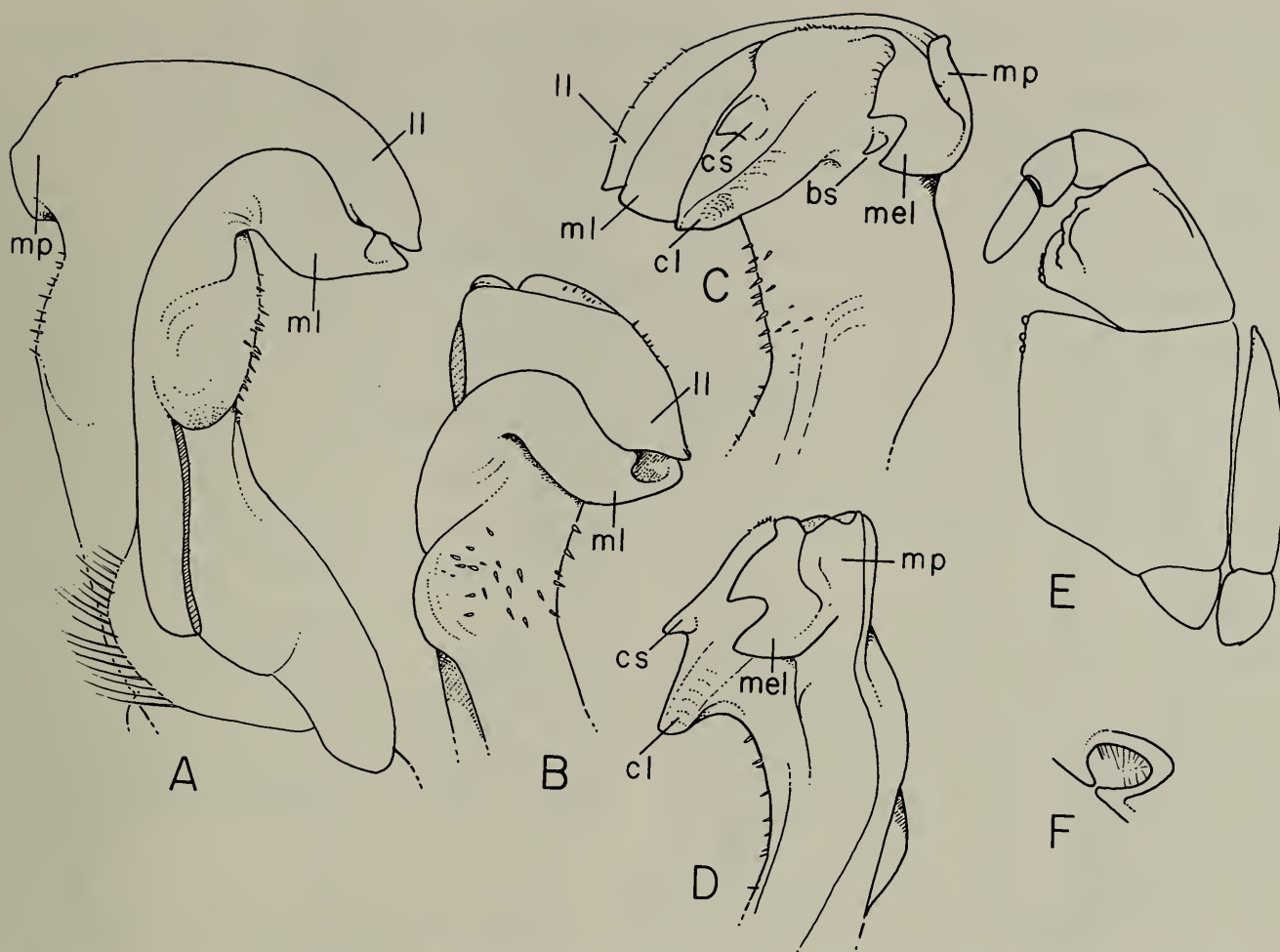


Fig. 1. *Strengeriana cajaensis*, new species, holotype. A–D, Left first gonopod: A, Total view, caudal; B, Same, detail of apex, lateral view; C, Same, cephalic view; D, Same, mesial view. E, Third maxilliped, left; F, Aperture of efferent channel, left. (bs, basal spine; cl, cephalic lobe; cs, cephalic spine; ll, lateral lobe; mel, mesial lobe; ml, marginal lobe; mp, mesial plate.)

lateral margin of the ischium of the endognath. The orifice of the efferent branchial channel is almost closed by a spine at the jugal angle and by the production of the lateral lobe of the epistome.

The male first gonopod is short and stocky in caudal view, with a wide expansion placed crosswise to the apical portion, where the slit-like genital pore is located, and a conspicuous rounded bulge on the lateral side. The apical expansion consists of a lateral twisting of the marginal lobe (Fig. 1A, B, C, ml), a rounded tooth-like lateral lobe (Fig. 1A–C, ll) which ends in an acuminate tip, and a widening of the caudal surface (Fig. 1A, mp) which gives a hammer-like appearance to the appendage. In cephalic view the apex presents (1) a bifid mesial lobe (Fig. 1C, D, mel) enveloped basally by the mesial

plate (Fig. 1A, C, D, mp), and with a small basal spine (Fig. 1C, bs); and (2) a large conical cephalic lobe (Fig. 1C, D, cl) with a hooked cephalic spine (Fig. 1C, D, cs) on its distal surface. In addition to the strong caudal setae, the appendage has numerous strong spinules on the lateral bulge which extend to the lateral surface, the mesial border has more slender spines, and the distal border of the lateral lobe has small spinules.

Color.—In the holotype specimen preserved in alcohol, the dorsal surface of the carapace and pereopods is uniformly dark brown. The ventral surface is cream colored.

Etymology.—The specific name refers to an abbreviation of Cajamarca, Colombia, where the type locality is situated.

Remarks.—This species can be clearly

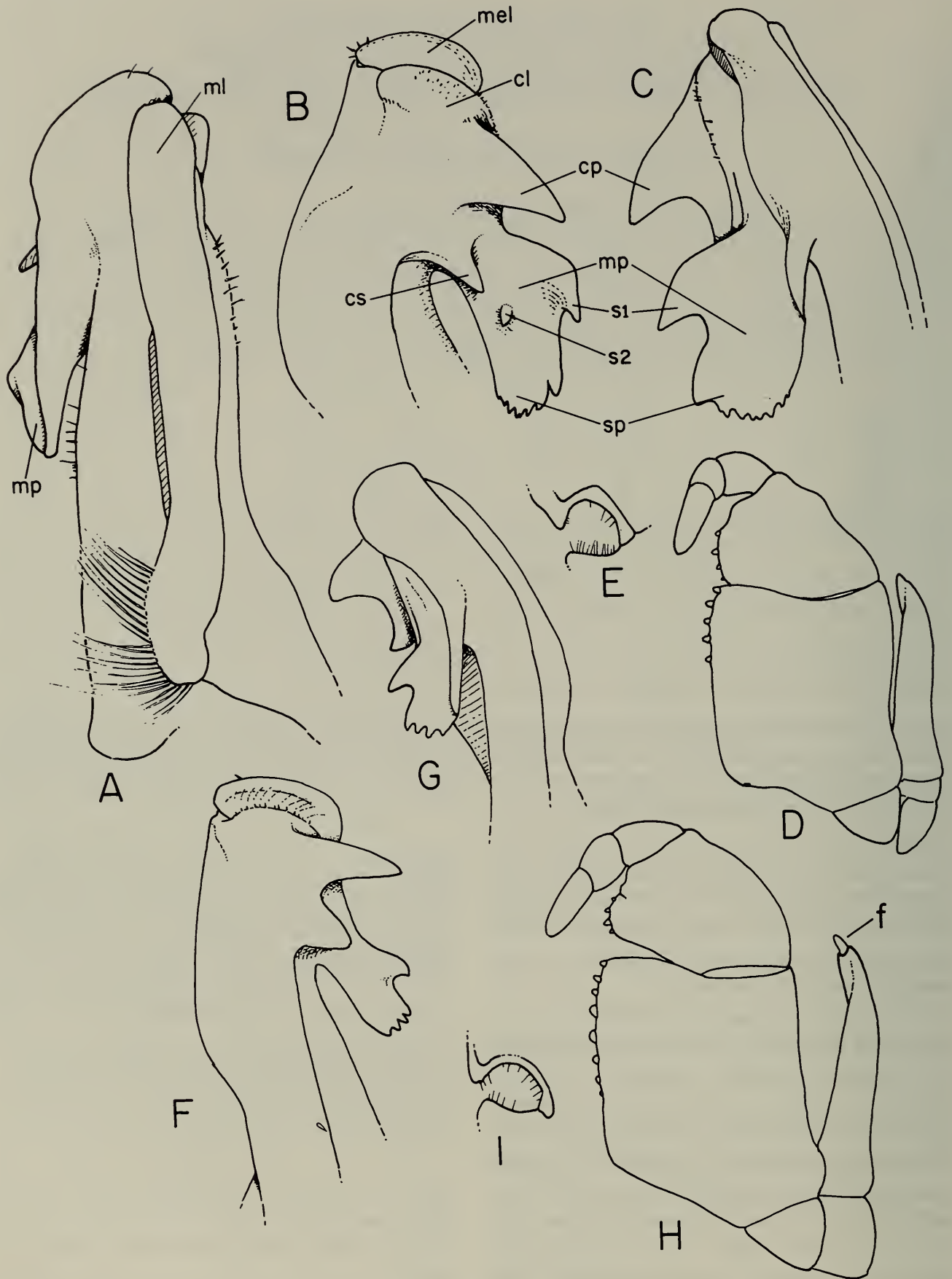


Fig. 2. *Strengeriana manifoldis*, new species, holotype (except F-I). A-E, Holotype, first left gonopod: A, Total view, caudal; B, Same, detail of apex, cephalic view; C, Same, mesial view; D, Third maxilliped, left; E, Aperture of efferent channel, left; F, G: immature specimen, left gonopod (F, Detail of apex, cephalic view; G, Same, mesial view). *Strengeriana flagellata*, new species, holotype: H, Third maxilliped, left; I, Aperture of

distinguished from any other in the genus by the hammer-shaped first gonopod. The slit-like genital pore, with small spinules over the caudal surface, and the folded mesial plate (Fig. 1A, C, D, mp) are characters it shares with other species of the genus. Furthermore, a number of homologies exist between the first gonopod of *S. cajaensis* and *Strengeriana chaparralensis* Campos & Rodríguez, 1984. The bifid mesial lobe (Fig. 1C, D, mel) has the same appearance and direction in both species, but it is shorter in *S. cajaensis*; the basal spine of this lobe (Fig. 1C, D, bs) is similar in both species. The large conical cephalic lobe (Fig. 1C, D, cl) of *S. cajaensis* is homologous with the spiniform cephalic lobe (Rodríguez & Campos 1989, Fig. 5, t) of *S. chaparralensis*; the cephalic spine (Fig. 1C, D, cs) is present in both. The large lateral bulge, covered with spines, of *S. cajaensis* is rudimentary in *S. chaparralensis*.

Strengeriana manifformis, new species

Fig. 2A–G

Material.—Municipio Cajamarca, creek by the side of the Central Highway, 1560 m above sea level, Tolima Department, Colombia; 3 Aug 1988; R. Sánchez; 1 male holotype, cb. 32.6 mm, cl. 21.2 mm, 1 juvenile (ICN-MHN No CR 0938).

Description.—The carapace is narrow (cb/cl = 1.54). The cervical grooves are slightly arcuate, thin on the distal half, deep and wide proximally, ending far from the lateral margins. The antero-lateral margins have a depression behind the orbits followed by 5–6 papillae and a series of approximately 10 regularly-spaced small teeth. The postfrontal lobes are small, oval shaped and low, marked on their anterior margins by the rugosities of the carapace. The median

groove is absent. The surface of the carapace between the front and the postfrontal lobes is moderately inclined anteriorly, and towards the middle. The upper border of the front is well defined, slightly convex in dorsal view, V-shaped in frontal view, marked with a row of conspicuous, well defined tubercles, and interrupted at the middle by a deep notch. The lower margin is strongly sinuous in frontal view. The surface of the front between the upper and lower borders is low. The surface of the carapace is smooth, covered by small papillae not visible to the naked eye; the regions are strongly demarcated.

The palm of the larger chela is moderately inflated; the fingers do not gape. The walking legs are slender, but not unusually elongated, the largest being those of the third pair (total length approximately 1.13 the breadth of carapace); the merus in this pair is 2.64 times longer than wide. The exopod of the third maxilliped overreaches the lateral margin of the ischium of the endognath. The orifice of the efferent branchial channel is almost closed by a spine at the jugal angle and by the production of the lateral lobe of the epistome.

The male first gonopods are short and stocky, with a long mesial process (Fig. 2A, mp) extending back to the middle of the appendage; the marginal lobe (Fig. 2A, ml) is simple, with a short ridge on its lateral surface; the mesial lobe (Fig. 2B, mel) forms with the cephalic lobe (Fig. 2B, cl) a long slit where the genital pore is located; the cephalic lobe bears a strong conical cephalic process (Fig. 2A, B, cp) and a strong proximal cephalic spine (Fig. 2A, cs). The long mesial process is oblong, with a strong distal spine (Fig. 2A, B, sl), followed proximally by a series of spinules (Fig. 2A, B, sp) which

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efferent channel, left. (f, rudimentary flagellum; cl, cephalic lobe; cp, cephalic process; cs, cephalic spine; ml, marginal lobe; mp, mesial process; mel, mesial lobe; sl, distal spine of the mesial process; s2, lateral spine of the mesial process; sp, spinules of the mesial process.)

progressively diminish in size, and a slender spine Fig. 2A, s2), located near the middle of the lateral surface of the process. In addition to the strong caudal setae and the small spines of the genital pore, the gonopod bears scattered long spines on the lateral side, small spinules over the distal border of the cephalic lobe and a few tiny setae on the mesial side.

Color.—The carapace and pereopods of specimens preserved in alcohol are entirely covered by a characteristic mottled pattern of light brown over a dark brown background.

Etymology.—The specific name is from the Latin “manus,” in reference to the hand-shape mesial process of the gonopods, and “formis,” shape.

Remarks.—The species is closely allied to *Strengeriana huilensis* Rodríguez & Campos, 1989, but both species can be easily distinguished by the characteristic shape of the mesial lobe of the first gonopod.

Strengeriana flagellata, new species
Fig. 2H, I

Material.—Patio Bonito, Municipio Corcoraná, 50 km SE of Medellín, creek by the side of the road, 1600 m above sea level, Antioquia Department, Colombia; 26 Jul 1989; G. Susatama; 1 male holotype, cb. 18.7 mm, cl. 12.3 mm (ICN-MHN No CR 1194).

Description.—The carapace is narrow (cb/cl = 1.52). The cervical grooves are shallow and straight, ending far from the lateral margin. The antero-lateral margin has a depression behind the orbit followed by a series of approximately 5 papillae and 15 small teeth which become indistinct posteriorly. The postfrontal lobes are small, oval shaped and low, obsolescent, not clearly delimited anteriorly. The median groove is absent. The surface of the carapace in front of the postfrontal lobes is moderately inclined anteriorly, and towards the middle. The upper border of the front is well defined, bilobed

in dorsal view, excavated in frontal view, marked with a row of 8 conspicuous, well defined tubercles at each side, interrupted at the middle by a shallow notch. The lower margin is sinuous in frontal view. The surface of the front between the upper and lower borders is high. The surface of the carapace is smooth, covered by small papillae not visible to the naked eye; the limits between the regions of the carapace are indistinct.

The palm of the larger chela is strongly inflated; the fingers do not gape. The walking legs are slender, but not unusually elongated, the largest being those of the third pair (total length approximately 1.05 the breadth of carapace); the merus in this pair is 3 times longer than wide. The exopod of the third maxilliped overreaches the lateral margin of the ischium of exognath, and is provided with a rudimentary flagellum. The orifice of the efferent branchial channel is almost closed by a spine at the jugal angle and by the production of the lateral lobe of the epistome.

The male first gonopods are strongly arched in the caudocephalic plane. The apex is formed by three distinct lobes; the mesial and marginal lobes are rounded, cup-shaped, with their borders strongly demarked; the border of the mesial lobe is strongly bent over at their cephalic and caudal ends; the cephalic lobe is very wide in lateral view, strongly sinuous in cephalic view, with its distal margin partially fused to the field of spines. There is a small finger-like projection located subapically on the mesial surface. The internal cavity of the mesial lobe is densely covered by long spines; there is a patch of shorter spines on the external surface of the cephalic lobe.

Color.—In the holotype specimen preserved in alcohol, the dorsal surface of the carapace and pereopods is uniformly light brown. The ventral surface is cream colored.

Etymology.—The specific name is from the Latin “flagellum,” a whip, and refers to

the rudimentary flagellum in the exopod of the third maxilliped.

Remarks. — The holotype specimen is not fully mature, but even at this stage some characters of the first male gonopods are discernible. These appendages resemble those of *Strengeriana fuhrmanni* (Zimmer, 1912), but they are conspicuously expanded in the caudo-cephalic plane, and the caudal lobe thus formed is strongly prominent and sinuous. The species can be clearly distinguished from any other in the genus by the unusual morphology of the exopod of the third maxilliped which overreaches the lateral margin of the ischium of the endognath, and possesses a rudimentary flagellum (Fig. 2H, f). This flagellum is absent in all species of Pseudothelphusidae, except for some species of *Epilobocera* from the West Indies. The unusually long exopod of the species of the South American *Strengeriana* and the West Indian *Epilobocera* has been interpreted by Rodríguez (1986) as a proof of the phylogenetic affinity of both genera. The presence of a rudimentary flagellum on the exopod of the third maxilliped in this species strongly reinforces this point of view.

Literature Cited

Campos, M. R., & G. Rodríguez. 1984. New species of freshwater crabs (Crustacea: Decapoda: Pseu-

dothelphusidae) from Colombia.—Proceedings of the Biological Society of Washington 97:538–543.

Pretzmann, G. 1971. Fortschritte in der Klassifizierung der Pseudothelphusidae.—Sitzungsberichten der Osterreich Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Klasse (1)179(1–4):14–20.

Rodríguez, G. 1982. Les Crabes d'eau douce d'Amérique. Famille des Pseudothelphusidae.—Faune Tropicale 22:1–223.

———. 1982. Centers of distribution of Neotropical fresh-water crabs. In R. H. Gore & K. L. Heck, eds., Biogeography of the Crustacea.—Crustacean Issues 4:51–67.

———, & M. R. Campos. 1989. Cladistic relationships of freshwater crabs of the tribe Strengerianini (Decapoda: Pseudothelphusidae) from the northern Andes, with comments on their biogeography and descriptions of new species.—Journal of Crustacean Biology 9:141–156.

Zimmer, C. 1912. Beitrag zur Kenntniss der Süßwasser dekapoden Kolumbiens. In O. Fuhrmann & E. Mayor, eds., Voyage d'exploration scientifique en Colombie.—Mémoires de la Société nêuchatoise des Sciences naturelles 5:1–8a

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